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NEWS

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BACKGROUND PRESS BRIEFING

U.S. AND USSR COOPERATION IN SPACE

PARTICIPANTS:

Arnold W. Frutkin, NASA Assistant Administrator for International Affairs

Julian Scheer, NASA Assistant Administrator for Public Affairs

SCHEER: Without further ado, Arnold Frutkin.

FRUTKIN: I have just so recently come back that I have to organize this as we proceed. You know that the subject is the discussions with representatives of the Academy of Sciencies of the Soviet Union on the possibilities for compatible rendezvous and docking arrangements.

A U.S. team, a NASA team, did meet on Monday and Tuesday with a Soviet team. I don't know if you have the names of those teams. I can give them to you if you want. The Chairman of the U.S. delegation was Dr. Gilruth of the Manned Spacecraft Center in Houston. And the Chairman of the Soviet team was Academician Petrov, who heads a Commission on International Cooperation in Space.

Other members of the Soviet team who may be of interest to you included cosmonaut Feoktistov, who is the Deputy Director of the Soviet manned flight program as well as a cosmonaut, and two technical people, engineers, who are concerned with Soviet rendezvous and docking.

In order to prepare properly for these discussions, the Soviet side did invite the American delegation on Sunday to Star City where their cosmonauts live and work. We were shown there manned spacecraft, as set up for training and simulation.

Dr. Gilruth and the other members of our team were taken into the spacecraft, all its systems were explained to them, and all their questions were answered. This did help very considerably in establishing a suitable environment and information base for the discussions.

On Monday our discussions began in a formal sense with an exchange of basic information on docking systems by the two sides. Our people described our Gemini and Apollo techniques, procedures and docking adaptors, hardware.

The Soviet side followed in the afternoon and did precisely the same thing in an entirely comparable fashion. This permitted us then to turn to the question of organizing ourselves for the problem of achieving compatible rendezvous and docking arrangements.

The discussion on that subject did produce an agreement which was signed yesterday noon at the Presidium of the Soviet Academy.

I will describe that agreement to you in general terms. The text will not be available until the agreement is confirmed by an exchange of letters between President Keldysh of the Soviet Academy and Dr. Low, the Acting Administrator of NASA. We are assuming there will be no difficulty whatever in arriving at that exchange of letters.

The agreement identifies a dozen specific technical areas or elements of the rendezvous and docking process which require further study. These elements are, of course, the guidance systems that are used for rendezvous, the hardware equipment used for the docking itself, coordinate systems, reference markings and so on.

Then we have agreed that there is certain supplementary information beyond that which was exchanged between the two sides on Monday, purely technical matters such as cabin atmospheres, which should be exchanged in the next month. And we have provided for that kind of exchange in November.

Following that we will establish three working groups to consider the technical requirements for making these system elements compatible. Those working groups will be concerned with essentially the rendezvous aspects, guidance questions and so on in the first case, then the hardware aspects, docking, and finally the operational approach to bringing these two into play for an actual compatible rendezvous and docking.

When the working groups have worked out essentially a common set of requirements, the two sides will then consider how to adapt their actual systems to those common requirements. What I am saying is that it isn't absolutely necessary that we have identical procedures or hardware, but simply that our hardware and procedures be sufficiently compatible to permit the result we want, which is rendezvous and docking together.

When we have such a design from each side we can then work on assuring their compatibility and take it from there.

That is essentially the picture here. I think you can see from what I have said that this was a very straightforward, open and forthright discussion which we find very encouraging and which we hope will lead to productive results in time.

I would be very glad to answer any question you may have.

SCHEER: You might mention on that first exchange that that's a written exchange I guess.

FRUTKIN: Yes, that exchange in November is simply an exchange by mail of certain supplementary technical information to round out the base that was established on the first day.

QUESTION: The cosmonauts who were over here a week or so ago -- Sevastianov I believe it was said that he thought it would be some time before the details and the hardware and the procedures could be worked out. Obviously, it won't be done next week. But could you give any idea with a moderate amount of good luck how soon rendezvous between a Soviet vehicle and an American vehicle could be a reality?

FRUTKIN: I would really not be able to speculate on that point, Bill, because it is clear that we're talking about future systems. We are not talking of adapting current systems because both sides recognize that this is really impractical to do. So, we're talking about future systems, future systems which are not likely to appear for sometime. So the pace of these discussions need not be pressed. Therefore, it is very difficult to say.

QUESTION: Then what you're really talking about and what the Russians and you were talking about was the future ability of a Russian spacecraft to visit an American space station and vice versa; is that it?

FRUTKIN: That is a good description of what we were doing; that is right.

QUESTION: These three working groups, will each be comprised of so many U.S. and so many Soviets? They have to be together. Would you go into a little more detail on how this will operate?

rms 5

FRUTKIN: Yes. The working groups are conceived as joint working groups with an equivalent number of Soviet and American representatives on each with co-chairmen, probably meeting alternately in the two countries and working together on this common problem, according to the schedule that I have described.

QUESTION: How far apart were they in the first look at their spacecraft, how far apart technically did you find this to be? Was it markedly different -- major or minor?

FRUTKIN: In terms of current systems you know that we have addressed ourselves to internal transfer of men between spacecraft through tunnels which is also the tunnel that accommodates the docking apparatus.

The Soviets have addressed themselves to a different problem. They have simply docked two spacecraft but without an interior tunnel, therefore, requiring that their men be transferred external to the spacecraft.

Now they described to us their plans for a future system very similar to our present Apollo system with tunnel and so on. So you might say that the two systems as we have them today were addressed to different purposes and therefore are not drawn on similar lines. But future Soviet plans would make the two systems very much closer in character.

QUESTION: Our shuttle vehicle and space station is well known. Can you pitch this towards the future vehciles? What are their future vehicles that would be comparable? Did they give you a look?

FRUTKIN: Well, you would have to ask them that.

QUESTION: Didn't they tell you?

FRUTKIN: You see, we were discussing rendezvous and docking sytems and not necessarily the vehicles that would incorporate them. That is in some part irrelevant. I don't know the configuration of their future vehicles.

QUESTION: Would this exempt Skylab from consideration?

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FRUTKIN: Well, we did discuss Skylab. Skylab was described to the Soviet delegation. I think it is recognized that Skylab is not quite a future system. It is really a system that is very close to realization now and therefore has very limited flexibility for accommodating a system still to be designed as common to both sides.

QUESTION: So you are not going to do it with Skylab?

FRUTKIN: The Skylab is very likely not in the picture.

QUESTION: Can you give us any more updating on the working groups as to when might the first rendezvous, hardware or operations joint working groups begin to get together again?

FRUTKIN: March-April.

QUESTION: March-April?

FRUTKIN: Yes.

QUESTION: Where?

FRUTKIN: We don't know whether the first meeting will be in the Soviet Union or here, but it is understood that they will alternate after the first meeting.

QUESTION: How large do you expect such groups to be?

FRUTKIN: We expect the working groups to be small, 3 to 5 people on each side, so probably 6 to 8 people altogether.

QUESTION: What level of authority and technical competence in each agency? For instance, at what echelon of officialdom would the working group be drawn from NASA, for instance?

FRUTKIN: We have not yet selected people for the working groups, so I really can't answer that question. But I think you can assume from the list of people who constituted the two delegations here that very responsible people will be selected.

QUESTION: Did the Russians tell you a great many things you didn't know about their systems. I mean I'm wondering if this is a new style of frankness for them?

FRUTKIN: I think that conclusion is warranted by our experience, yes.

QUESTION: If they are shifting from an external transfer mode to an internal one, why don't they just adopt ours, since it is for a future vehicle?

FRUTKIN: I couldn't answer that question either.

QUESTION: Is that a possibility?

FRUTKIN: Well, there are really two points here. One, I think we can assume that their system has been long in the design stage, because we were shown quite complete drawings for that system.

Secondly, our own system is not our final system. We are not going to be using that same system when we get to the space shuttle. We expect to improve on that.

QUESTION: Do the two sides expect to include any astronauts in the working groups?

FRUTKIN: That has not been decided. Although I suppose it's always a possibility, particularly when you talk of the operating working group, the working group concerned with operations in space.

QUESTION: Did the drawings include the complete spacecraft rather than just the transfer part of it?

FRUTKIN: No. We focused throughout on the rendezvous and docking elements of spacecraft rather than on spacecraft in the whole.

QUESTION: Have any American representatives ever had such a close-up look at a Russian spacecraft and had all their questions about it answered?

FRUTKIN: Well, some of our astronauts, Neil Armstrong and Frank Borman, did visit Star City and did visit the simulator. But you realize in this case you had

senior engineers in the manned spacecraft program in that position.

QUESTION: How far is Star City from Moscow or some other well known place?

FRUTKIN: It is about an hour's drive from Moscow.

QUESTION: I realize you can't put a time on this, but is there any point of reference we can use? Are you talking about five years, ten years, or what?

FRUTKIN: In terms of the results which these working groups ought to achieve, we would hope that the next year would show very substantial progress toward the definition of possible compatible systems, the implementation of those systems is another matter which rests entirely on the pace of our respective programs.

QUESTION: What is the name of this Russian system?

FRUTKIN: I'm sorry.

QUESTION: What is the name of the Russian systems, the drawings they showed you?

FRUTKIN: I couldn't give you a name for it. It is a Soyuz system in one case for internal transfer of cosmonauts and in the other case for external transfer of cosmonauts.

QUESTION: Did what they said to you confirm what has been previously announced in bits and pieces, that they are committed to building a large earth orbital space station?

FRUTKIN: I don't think we can connect those two points.

QUESTION: How much of this was given to you on a don't reveal basis?

FRUTKIN: There were no constraints placed on our discussions whatever, except that we have agreed not to

release the text of our agreement until the courtesies are fulfilled of confirming them.

QUESTION: But while you might focus on rendezvous and docking, certainly from the fringe you would get a very good idea of the direction it is going. Do you get the feeling that they have a similar shuttle, space station type of program that we have?

FRUTKIN: You don't reach those conclusions from our discussions. You reach those conclusions from many public statements by Soviet officials which indicate they do have a space station program and that they are thinking about vehides like the shuttle. They've made that abundantly clear in various official statements.

QUESTION: Arnold, there has been quite a thrust toward international cooperation in all our activities beyond Skylab. We've been over to Europe and talked to people and so forth. The Russians no doubt are aware of these. Are they willing to go along. It seems to me that if we have a cooperative program from our side and we're compatible with their stuff, it is almost a cooperative program for them with everybody else. Was that discussed at all?

FRUTKIN: No, that was not discussed.

QUESTION: Did you try to determine whether, if a rendezvous procedure could be worked out, an emergency rescue transfer would be possible with EVA with existing systems; or did you discuss this at all?

FRUTKIN: That was not discussed.

QUESTION: Could you tell us how you talked to each other. Did you have translators, or did some Russians speak English and vice versa?

FRUTKIN: We did have interpreters. But I must say that the Soviets have more proficiency in English than we have in Russian.

QUESTION: Did you find that difficult in a technical area like this to --

FRUTKIN: No, not at all. There has been a

great deal of experience in talking with the Russians in the past. This has not been a problem.

QUESTION: In any docking, how would communications be carried out between the two nationalities with different languages?

FRUTKIN: Well, it's been demonstrated that talented people can learn each other's language.

QUESTION: How many American astronauts speak Russian then?

FRUTKIN: There are none at present, but that's a situation which can be repaired. The vocabulary for rendezvous and docking need not be very extensive. And it can be supplemented by various signal arrangements, coded signal arrangements.

If it can be done automatically, it can be done by a voice or code system without much difficulty.

QUESTION: Would a different language be hit upon, German perhaps?

(Laughter.)

FRUTKIN: Louie,did you have a question?

(Laughter.)

QUESTION: At the conclusion of your talks is there a time scheduled for another meeting by the principal teams such as this one? And did you get into other areas that you might explore at a future time? In other words, did this get beyond rendezvous and docking?

FRUTKIN: Well, the next meeting of principals, so called, would likely follow the March-April meeting of the working groups. And we have not set a schedule for that. I think it is clear that both sides would like to move along in a businesslike and expeditious manner. There's no rush required here because of the time schedules for spacecraft. But I think we both would like to move along in a businesslike way.

QUESTION: Was there any discussion or understanding reached about the difference in the systems of measurement between our two countries, the English and the metric, and how this would be coped with?

FRUTKIN: There was no discussion of this at all.

QUESTION: Will that have to be discussed and arrived at before you can really go ahead and build hardware; or can we build in English and they build in metric and then it all fits together nicely?

FRUTKIN: Well, you do something that's neither one nor the other. We have some experience with that because you know that we've been mating European spacecraft to American launch vehicles for a long time. This is done by simply providing a prototype of the interface hardware from one side to the other. And they simply build to the size of that piece of hardware. It's an empirical system.

QUESTION: You are already metric in your literature; aren't you?

FRUTKIN: We are practically metric in our literature. January 1st is the magic date I think.

QUESTION: If the Russians have provided us with more and more detailed information in this exchange than they have been doing in the past, why do you think that was? Is it because of the fear of an accident in space and potential rescue efforts? Could Apollo 13 have had anything to do with it?

FRUTKIN: Well, again, that calls for a lot of speculation. I think we are taking the Russian interest in this prospect at face value. It is an interest that we share without having to become obscure about the motivation for outselves. I mean we think this is a positively good thing to do, and I think it serves our purpose to assume that they think so too.

Now people who put other people up into space certainly want to take advantage of every opportunity to provide for their rescue if that is necessary. I think the Soviet side shows very serious concern on that score, and I think we respect that concern and share it.

QUESTION: Will there be details released on exactly the docking arrangement they have and are working on and ours, since the two groups obviously must exchange complete details? Will this become a public type of document do you think?

FRUTKIN: I think we're very likely to follow the practice that we will release our material and allow them to release theirs. I don't imagine we will be releasing their material. That's not the usual practice.

Yes, sir.

QUESTION: If Skylab does not seem to be appropriate or very realistic, do you think then that the space shuttle would be a more plausible time for compatible docking?

FRUTKIN: I think that's a good assumption, yes.

Mr. Scheer has suggested that I mention to you the fact that our delegation was taken yesterday morning to a geochemical institute in Moscow and shown the lunar samples retrieved by the Soviet vehicle, Luna 16. And I understand that we may have been the first non-Russians to have seen those samples.

Again we were provided full access to the laboratory where the samples are being analyzed and all questions were answered very frankly. We hope verymuch that there will be an opportunity in the near future for Soviet scientists to appear with our own in a conference, a large conference, not a bilateral one, at which the progress in lunar science as a consequence of the Apollo program and the Luna 16 program will be reviewed and recorded.

QUESTION: Do the Russian moon rocks look any different from the American moon rocks?

FRUTKIN: The particular sample the Russians have retrieved is very largely of very fine particles. It tends to become more granular as you get deeper in the sample. But on the whole it is more a dust sample than a rock sample.

QUESTION: Did they show any interest in exchanging samples for comparative analysis?

FRUTKIN: This was not discussed. It is always a good possibility. But it was not discussed, since our mission of course was confined to the rendezvous and docking purpose. But the results of their analysis and of our analysis certainly can and will be exchanged I have no doubt and hopefully at the conference in Houston in January which is the one I referred to a moment ago.

QUESTION: Have any of their scientists seen any of our lunar material, scientists, not just visiting space officials?

FRUTKIN: I cannot answer that question.

SCHEER: I guess at COSPAR they saw an exhibit.

FRUTKIN: Yes, that's true.

SCHEER: That's about it.

QUESTION: They didn't get any to work with?

SCHEER: No.

FRUTKIN: Bill, they were offered an opportunity to acquire samples. They simply didn't choose to avail themselves of that opportunity.

QUESTION: Did they say what was the total weight of the lunar samples brought back by Luna 16. We have seen various conflicting figures.

FRUTKIN: The figure I saw in the press was about 120 grams, and the sample we saw would be consistent with that figure, roughly.

QUESTION: There has been some speculation that the Zond flights may be a precursor of manned flight around the moon, not a landing. Have you picked up any indication on that?

FRUTKIN: No. These were working sessions. We paid attention to business pretty much.

SCHEER: Thank you.

FRUTKIN: Thank you.

(Whereupon, at 3:25 p.m., the conference was concluded.)

A (ampere)

Abelian

ac (alternating current)

active satellites

AeroChem

Aeros satellite

aerospaceplanes

AeroZINE

Air Force

Alouette satellite

ALSEP (Apollo Lunar Surface Experiment Package)

AM (amplitude modulation)

a.m.

AND gate

AND-NOT gate

Anna satellite

AOSO (Advanced Orbiting Solar Observatory)

Applications Technology Satellite (ATS)

Apollo spacecraft

Ariel satellite

Army

atm (atmosphere)

Aurora 7

alnico

All months of the year abbreviated except June, July and May.

bcc (body centered cubic)

Beacon Explorer A

Beacon satellite

BeV (billion electron volts)

BIOS (Biological Investigation of Outer Space)

Biosatellites

bremsstrahlung

Btu (British thermal unit)

Banach space

Boussinesq approximation

C (Coulomb) unit of measurement

C-band

Cassegrain

C (centigrade, Celsius)

chaff

communication satellites

Cosmos satellites

Coulomb collision, etc.

Courier satellite

cm (centimeter)

command module (CM)

Communist

Congress

Congressional

CW (continuous wave)

D-lines

Data Relay Satellite System (DRSS)

D-1 satellite

db (decibel)

dc (direct current)

Deep Space Instrumentation Facility (DSIF)

Deep Space Network (DSN)

Defense Communications System (DCS)

deg (no period)

delta wing

Diademe satellite

Direct Readout Equatorial Weather Satellite

Discoverer satellite

DODGE satellite (DoD gravity experiment)

Doppler

Dirichlet

E-region

Early Bird satellites

Earth Resources Observation Satellite (EROS)

Earth Resources Program

Earth Resources Technology Satellite (ERTS)

earth satellites

Echo satellites

EGO

EHF (extremely high frequency)

eigenvalues

EK to chrome

Elektron satellites

ELDO (European Launcher Development Organization)

ELF (extremely low frequency)

emf (electromotive force)

Environmental Research Satellite (ERS)

ESRO satellites

ESSA satellites

European 1 spacecraft

eV (electron volts)

evasive satellites

Explorer satellites

F (Fahrenheit)

F-region

Faith 7

fcc (face centered cubic)

FCC (Federal Communications Commission)

Federal

Federal Government

Fermi

ferry spacecraft

fiber glass

Fiberglas (Trademark)

FM (frequency modulation)

FORTRAN

fps (feet per second)

FR-1 satellite

Freedom 7

French satellite

Freon (Trademark)

Friendship 7

ft (no period)

FY (fiscal year)

FY 1969

Fredholm equations

g (gravity)

G (gravitational constant)

gauss

Gaussian

Gemini spacecraft

geodetic satellites

GEOS (Geostationary Environmental Operational Satellite)

GeV (giga electron volts)

GHz (giga hertz)

gravity gradient satellites

GREB satellites

Hamiltonian

Hastelloy (Trademark)

Helios satellite

HEOS (Highly Eccentric Orbiting Satellite)

HF (high frequency)

hr (no period)

Hz (hertz)

Iapetus

IF (intermediate frequency)

iff (if and only if)

IMP (Interplanetary Monitoring Platform)

in. (with period)

Inconel (Trademark)

Injun satellites

Inspector satellite

Intelsat satellite

Invar (Trademark)

IR (infrared)

IRIS (International Radiation Investigation Satellite)

ISIS (International Satellite for Ionospheric Studies)

Janus spacecraft

jimsphere

joule (unit of measurement)

Joule constant, cycle, etc.

K (Kelvin)

K-band, -corona, -display, etc.

kc (kilocycle)

Keplerian orbit

keV (kilo electron volts)

kg

km

Ku band

kW

KWIC (key word in context)

KWOC (key word out of context)

Kantorovich

L/D ratio

Large Astronomical Satellite (LAS)

Largos satellite

Launch Complex 39

launch vehicle

LF (low frequency)

Liberty Bell 7

Lincoln Experimental Satellite (LES)

loran

Low Frequency Transionospheric Satellite

Lunar Mapping and Survey System (LMSS)

lunar module (LM)

Lunar Orbiter

lunar probes

Lunik lunar probes

Lallace
Loertz

Mach

Manned Orbital Laboratories (MOL)

Manned Orbital Research Laboratories (MORL)

Mark (Mk)

Mariner space probes

MARS (Manned Reusable Spacecraft)

Mars probes

Mars 1 spacecraft

Mc (megacycle)

mercury Rankine

Mercury spacecraft

meteorological satellites

MeV

MHz

Midas satellites

mm

Mod (model)

Molniya satellites

mph

msec

MW (million watts)

mW (milliwatts)

National Operational Meteorological Satellite Services (NOMSS)

navigation satellites

Navy

Newtonian fluids

non-Newtonian fluids

NERVA

Nimbus satellites

no. (number)

Northern Hemisphere

n-p junction

n-p-n junction

nsec (nanosecond)

n. mi. (nautical mile)

nth degree

nth power

OAO (Orbiting Astronomical Observatory)

OGO (Orbiting Geophysical Observatory)

OR gate

ORBIS (Orbiting Radio Beacon Ionospheric Satellite)

orbital space stations

orbital workshops

OSO (Orbiting Solar Observatory)

P-phase

Pageos satellite

PAM (pulse amplitude modulation)

passive satellites

PCM (pulse code modulation)

Pegasus satellites

PFM (pulse frequency modulation)

pH effects

Phobos (natural satellite)

p-i-n diode

Pilgrim Explorer

Pioneer space probes

Planetary Explorers

Plexiglas (Trademark)

PM (phase modulation)

p.m.

POGO (Polar Orbit Geophysical Observatory)

Polyot satellites

Proton satellites

psi

psia

psig

Q factor

radar

Radio Astronomy Explorer (RAE)

ramjet

RAND

Ranger lunar landing vehicles

Ranger lunar probes

Rebound communications satellite

Relay communications satellite

relay satellites

Rene (Trademark)

RF (radio frequency)

rocket vehicle

Reggie

S-band

SAMOS

schlieren

scientific satellites

Score satellites

scramjet

SHF (superhigh frequency)

Skynet communications satellite

shoran

Sigma 7

Small Astronomy Satellite (SAS)

Small Scientific Satellite (SSS)

SNAP

Snapshot satellites

solar observatories

solar probes

Solar Radiation Satellite (SolRad)

sonar

Soyuz spacecraft

Soviet bloc

space stations

Sputnik satellite

STADAN (Satellite Tracking and Data Acquisition Network)

Sunblazer space probe

Surveyor lunar probes

Synchronous Meteorological Satellite

synchronous satellites

Syncom satellites

Tacan

Technology Feasibility Spacecraft

Teflon (Trademark)

Telstar satellites

Tiros satellites

Transit satellites

TWT (traveling wave tube)

UHF (ultrahigh frequency)

Univac

Ural

US (NOC and title)

U.S. (abstract)

USSR (NOC and title)

U.S.S.R. (abstract) and indexing

UV (ultraviolet)

V (volt)

Van de Graaff

Van der Waals

Vanguard satellite

Vela satellite

Venera satellite

Venus probes

Vesta asteroid

Viking Lander Spacecraft

Viking Mars Program

Viking Orbiter Spacecraft

VHF

VLF

von Karman

Voskhod spacecraft

Vostok spacecraft

V/STOL

W (watt)

X-band

X-ray (abstracts)

X ray (NOC)

Zircaloy (Trademark)

Zond space probe